

THE RHODE ISLAND MEDICAL JOURNAL

VOLUME XXII

FEBRUARY, 1939

NUMBER 2

HEPATO-BILIARY SYNDROMES

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For several years we have been interested in the diseases of the liver and bile passages. While these studies have been in progress, much work on this important region of the body has appeared in the literature. In this article we shall review briefly some new concepts of considerable clinical import and present in a general way our own observations, attempting to indicate, on the basis of recent work, the clinical applications that can logically be made.

In spite of much research, and even more speculation, the pathogenesis of hepato-biliary disease has remained ill defined. A great deal of the work, though useful to physiology, has been of little value to the clinician. Studies of the hepato-biliary system in animals cannot be applied to man in any but the most superficial manner. It is in the hospital clinics, wards, operating theatres and laboratories that the battle of disease has to be fought; for the most part, by the common field forces—the clinicians.

The trend of modern medicine has also led to an increased interest in functional disturbances which may precede or even cause organic changes in structure. The production of symptoms by an altered physiology, and not due solely to structural aberration, has been too long neglected under the influence of the German school of pathologic anatomy. Modern, practical clinical methods of exploration have enabled us to study this altered human physiology quite adequately. Regarding the intestinal and biliary tracts, we have gained extremely useful information by studying under clinically controlled conditions gastric, duodenal, biliary and pancreatic secretions. Direct visualization of the stomach by means of the gastroscope, small bowel intubation studies, indirect visualization of the gall bladder and of the whole extra-hepatic biliary tree, have resulted in data whose significance has not yet been fully realized. In the light of this new knowledge we present some clinical syndromes that have thus become recognized.

Biliary Dyskinesia

We shall not concern ourselves with the well established clinical entity of cholecystitis and cholelithiasis. Here, the pathology, symptomatology, diagnosis and treatment has been extensively described. Only a word must be said in passing. Given a patient with a history of colic, indigestion, jaundice, and whose cholecystograms show definite evidence of pathology, the only and finite therapy is surgical intervention. This seems to need re-emphasis because we have lately seen ruptured gall bladders, gangrene, abscesses and fistulas,¹ resulting from attempts at cure by medical management. As Dr. Lahey has so frequently stressed, the general practitioner to whom the vast majority of these people come for diagnosis, treatment and disposition, must realize that these cases cannot be carried through repeated attacks; they should be submitted to operation while the disease is still in great measure confined to the gall bladder. Common duct obstruction is the result of long standing cholelithiasis and the liver and pancreas are almost always involved. "Only timely surgery will give lower mortality and better end results."²

However, there is a group of cases with definite and variously severe symptoms referable to the biliary system and showing no demonstrable or consistent deviations from the normal as measured by modern methods of investigations, whom surgery gives little if any relief. These cases (about 50% of all those with biliary complaints!)³ have been a source of trouble and dissatisfaction to their physicians. In order to discuss these cases adequately it is necessary to consider briefly the newer physiology of the biliary system.

During twenty-four hours the liver normally secretes from 500-1300 c.c. of a thin watery bile continuously at a pressure of 300-360 mm. of water. When this pressure is exceeded, liver secretion ceases. The reaction of hepatic bile is alkaline, the pH ranging from 7-8.5.⁴ Its most important constituents are bilirubin, bile salts, cholesterol, fats, base, chlorides, bicarbonates, at times bacteria, immunologic constituents, and so on.

From the Department of Gastro-Enterology, The Johns Hopkins Hospital, Thomas R. Brown, Chief. Read before the Pawtucket Medical Association, on June 16, 1938.

During infectious febrile diseases, such as pneumonia, bile output is decreased. This is also probably true with chronic passive congestion of the liver and with portal hypertension from whatever cause. As we shall show subsequently, increased resistance at the duodeno-choledochal junction can diminish or entirely suppress liver secretion of bile. About the only substance that is definitely known to have a choleric effect is bile salt, and this only increases the fluid volume of the bile, the total output of bilirubin and other biliary constituents (notably dyes) remain unaltered or even slightly diminished.² With the sphincters of Oddi contracted, the bile ducts fill and the hepatic bile flows into the gall bladder. During fasting it is here concentrated about ten times. The mucous membranes of the fundus and body of the gall bladder affect this by the absorption of water, chloride and bicarbonate, so that these substances are markedly decreased in both absolute amount and in concentration.

The concentration of cholesterol and bilirubin is increased, none being normally either secreted or absorbed. Calcium and the bile salts are concentrated, only small amounts being absorbed normally. The mucous membranes of the gall bladder and bile ducts add nothing but mucous to the bile. During this process of absorption and concentration the pH of the bile is lowered, and at this acid reaction the bile acids render the cholesterol and fats soluble.

When the hepatic secretory pressure of 300 mm. of water is exceeded, as can so easily happen, the liver parenchyma no longer functions normally and the hepatic bile becomes altered in composition. As a result, and also because of a concomitant increased activity of the mucosal cells lining the ductal system, "green system" bile, lightly pigmented, or so-called "white bile" will be found in the biliary passages, depending on the severity and/or duration of the increased intra-ductal pressure. This may occur with the following:⁶

- (1) Toxic Hepatitis (chloroform, arsenic, etc.)
No bile formation due to obvious liver cell destruction.
- (2) Common duct obstruction with a functionless gall bladder. Cholecystitis, cholelithiasis, cholangitis, etc.
- (3) A liver secreting against increased pressure in the absence of total obstruction. "Physiologic block."

The last leads us directly to a consideration of the other important function of the biliary tree: motility. Since the hepatic, lower cystic, and the greater

portion of the common duct are passive fibro-elastic tubes, this refers to the gall bladder and its intimate relative — the choledochoduodenal junction. The common bile duct and the hepatic duct enter the second portion of the duodenum obliquely and usually through a common orifice, the papilla of Vater. Where the common duct joins the duodenal wall smooth muscle appears (see figure 1) and is thicker than anywhere else in the extra-hepatic biliary system. The muscular end of the common duct here consists of two structures:⁴

- (1) The long, oblique-fibred ampulla into which empties the pancreatic duct.
- (2) The small terminal ring of muscle embracing the tip of the papilla of Vater which strictly is the Sphincter of Oddi.

The wall of the ampulla is very much like the ejaculatory muscle around the urethra.⁷

The gall bladder and these choledochal muscles are reciprocally innervated and form a functional unit. The latter very competently prevent the regurgitation of duodenal contents as well as air into the common duct. They also regulate the intraductal pressure and the egress of bile and pancreatic juices into the duodenum. The tone of this efficient sphincteric mechanism is maintained by the left vagus and modified by the splanchnic sympathetics. The nervous mechanism is supplemented by a humoral one—by cholecystikinin, a hormone said by Ivy to be produced in the duodenum and upper intestine. The sphincters are influenced by local duodenal reaction to foods, to various drugs, or infection, and to reflex stimuli coming from other portions of the G. I. tract. A mechanism that is air-tight and yet so responsive can become functionally deranged very easily and long before gross anatomical changes take place. In fact, that is now considered the logical sequence. Considerable emphasis has been given the obvious organic obstructions of the common duct, such as stone, neoplasm, stricture; but little attention has been paid to physiologic dysfunction of the choledochal muscles which may obstruct the outflow of biliary and pancreatic secretions. Since the extra-hepatic biliary tract, like the G. U. tract, is really a conduit system, interference with free drainage can give rise to enormous dilatation of the entire biliary tract.⁸ This functional block may also be the instrumental factor in the genesis of stones, infection, etc. Spasm of the sphincters of Oddi, just like spasm of the cardiac end of the oesophagus, like spasm of the pylorus, or of the anal sphincters, is a

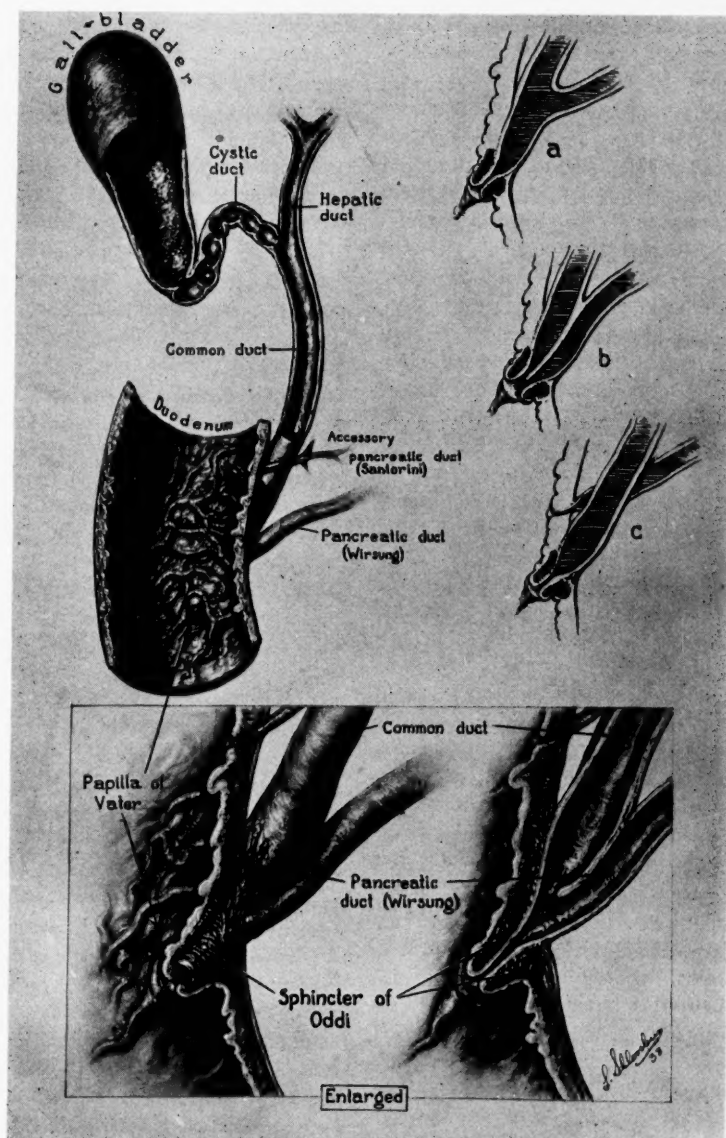


FIGURE 1. Note the long, oblique-fibred ampulla into which empty the pancreatic and common ducts. The illustrations at the upper right show common variants found at operation or autopsy.

definite demonstrable condition in whose wake follow stasis, dilatation, hyperperistalsis, and muscular hypertrophy. Such a concept is compatible with the fact that all sphincters in man may deviate from the normal by showing hypertonicity. In the G. I. tract they usually all do. The gall bladder in trying to evacuate against this physiologic block produced by sphincter spasm which can withstand over twice the pressure which the gall bladder can muster, will give rise to true biliary colic, nausea, bloating and the whole train of familiar complaints.⁹ Clinicians have for some time suspected the possibility of such a purely functional derangement with only secondary anatomic changes as responsible for liver and gall bladder pain. Many surgeons have encountered hepatic congestion, bile stasis, and dilatation of the biliary ductal system without demonstrable organic anatomic cause for the obstruction. The first clinical report of gall bladder colic without stone or infection was made by Krukenberg in 1903. His report gave no explanation and attracted no attention. Based on the anatomic work of Oddi and supplemented by physiologic experiment, Meltzer¹⁰ in 1917 and Lyon¹¹ in 1919 suggested that hypertonicity of the sphincters of Oddi might act as a mechanical block in producing biliary colic and even jaundice. This too, drew little notice or clinical application. John Berg, a Swedish surgeon, finding undoubted absence of structural change in cases of undoubted biliary dysfunction, considered a physiological disorder of the choledochal sphincters as the logical explanation. He showed a case with hypertrophy of these muscles. This has been corroborated since by Giordano and Mann,¹² Nuboer,⁷ and Newman, and others. The whole subject was finally put on a new basis in 1931 by the work of Westphal and his collaborators¹³ who called this condition "hypertonic dyskinesia." Since then this syndrome has enjoyed such names as "spastic distention"¹⁴ "Cholepathia spastica"¹⁴ "biliary dyskinesia"¹⁵ "spastic dysfunction"¹⁶ and "biliary dyssynergia."¹⁸ Most of this work has unfortunately gone unheeded because "adhesions" and "inspissated bile" provided a facile explanation which suppressed thought for many years. Radiographic visualization of the extra-hepatic bile ducts has helped to establish this syndrome as an entity.

Robins and Hermanson¹⁷ of Boston and Best and Hicken¹⁸ of Nebraska have developed and described the technique of X-ray visualization of the bile ducts at operation. Hundreds of such im-

mediate cholangiograms have enabled Dr. Robins to diagnose elusive common and hepatic duct stones, to determine with certainty the patency of the cystic duct when a short-circuiting procedure was contemplated, and to aid in the diagnosis of pancreatitis or tumor of the head of the pancreas. The wider acceptance of this precise, practical surgical aid will obviate the unfortunate sequelae of inadequate exploration and prevent unnecessary opening of the common duct.

Of equal value has been delayed cholangiography. In cases presenting post-operative biliary catheters or fistulas, injection of hippuran makes visible for study the status of the bile radicles and the ampulla. Hippuran is a 48% aqueous solution of organic iodine and best serves the purpose. It mixes readily with bile and flows easily through the bile passages. The other common opaque media are too viscous or too dense and will obscure small stones. Some very important details in the technique of injection we hope to include in a subsequent paper. Cholangiography has made possible the study of the biliary tree of humans under experimentally varied conditions and its response to proper physiologic and pharmacologic stimuli. Should symptoms recur and bile disappear from the stools, cholangiography will indicate with certainty whether re-operation is necessary. At such times it may be a life saving procedure.

As has been extensively recorded in the literature,^{10, 20, 21, 22} the following facts have been culled:

1. The retrograde injection and visualization of the biliary tree can take place only if there is a block at the duodeno-choledochal junction. The ducts resist in a marked manner such retrograde injection and the opaque medium runs into the duodenum before the film can be exposed. This was shown by Ginsburg and Benjamin²³ in the case of post-operative duodenal fistulas.

2. The sphincters usually become incompetent after cholecystectomy, bile dribbling into the duodenum as in animals without a gall bladder. Later, as competency is regained, the ducts dilate as the intrabiliary pressure rises. In spastic states the sphincters do not become incompetent.

3. The tone of the choledochal-sphincteric mechanism is not produced by the tone of the duodenal wall,²⁴ but is, nevertheless, influenced by it and by other portions of the G. I. tract. It increases for example, with fasting, with sudden distension of the stomach and duodenum, and with the acidity

of the gastro-duodenal contents. So-called gall bladder symptoms are really duodeno-gastric reactions. We believe the textbook's descriptive differentiation of one from the other a myth.

4. The normal intra-ductal pressure as measured post-operatively in man equals from 0-30 mm. of water. The perfusion pressure—the height of fluid in a manometer necessary to overcome sphincteric resistance and cause fluid to flow into the duodenum—ranges around 150 mm. of water. The gall bladder and liver can muster a pressure of 300-350 mm. of water.

5. Drugs profoundly effect the sphincteric mechanism by way of the autonomic nervous system, or by their action on smooth muscle directly.

Contraction-muscarine, pilocarpine, physostigmine, nicotine, and acetylcholine stimulate the tonus of the sphincters. Acid locally also produces contraction. The most important drug to be considered is morphine, which has long been known to cause smooth muscle spasm.²⁵ It causes a rise of perfusion pressure from the normal 150 mm. of water to about 400-700 mm. of water within two minutes of injection. And this extreme pressure is maintained for about four hours. Its alkaloidal relatives, pantopon, dilaudid, and codeine act in like manner. It can be shown that morphine can bring on severe gall bladder colic. Many patients will experience their first attack of gall bladder pain upon the chance administration of morphine after a tooth extraction, pre-operatively in extra-hepatic surgery. The use of morphine or its derivatives to control the pain of colic is like clubbing the patient, it merely interrupts the function of the sensorium.

Relaxation-atropine subcutaneously or in the form of the ordinary tincture of belladonna, causes relaxation by para-sympathetic paralysis. Its prolonged action makes it clinically valuable. Scopolamine also causes relaxation, especially in combination with atropine. We have no good sympathetico-mimetic drugs. Dr. Robins and I could not satisfy ourselves that benzedrine, even in heroic doses, had any constantly definite effect. The same holds true for adrenalin and papaverine which otherwise act directly as smooth muscle relaxants. The most efficient drugs in this regard are: warm magnesium sulphate locally, glyceryl trinitrate (nitroglycerin) 1/100 grain under the tongue, and amyl nitrate by inhalation. The latter gives a transient but very marked effect. The former (glyceryl trinitrate) has a more prolonged action. Both act by their direct effect on smooth muscle.

Ivy²⁶ and Cole²⁶ maintain that pituitrin relaxes the sphincters of Oddi and causes the gall bladder to evacuate $\frac{1}{4}$ to $\frac{1}{2}$ of its contents. This is important, in view of the fact that this drug has been much used of late for clearer X-ray visualization of the gall bladder. We know of no good series of controlled studies that have settled this important point.

Based on this data we can predicate a rational therapeutic and prophylactic routine for post-cholecystectomy cases.

Included in the usual post-operative care should be:

1. Atropine grs. 1/100 to 1/75 subcutaneously, or tincture of belladonna, drops 15-20, three times daily.
2. Glyceryl trinitrate grs. 1/100 under the tongue one-half hour before each meal, three times a day, during the hospital stay. The hypodermic tablets dissolve readily.
No untoward effects have been noticed even after prolonged use.
A new smooth muscle relaxant—an extract of pancreatic tissue—has just been described. We know nothing about it.
3. A thick cream egg-nog, or olive oil for those who can take it, may be given nightly. The undesirable purgative effect of mag. sulphate post-operatively offsets its beneficial effect on the duodenum and sphincters.
4. Patients with a T-tube, catheter, or fistula should have their common duct irrigated with sterile warm saline or olive oil about every other day.
5. In cases of biliary fistulas or where one is feared, and in cases with low liver reserve, for that matter after any biliary surgery, morphine and its derivatives should not be used. For the control of pain there are other analgesics. For the control of colic, amyl nitrate is most efficient.

Such a regimen will maintain free biliary drainage; it will serve to flush out organized debris, mucus plugs, and small stones.²⁷ It will help early restitution of good liver function and, in many cases prevent re-operation.

Case 1. This patient, a 48 year old housewife, presented a history of gas, sour eructations, nausea, etc., coming on after pregnancy fourteen years previously. During the year before admission there had been several attacks of gall bladder colic and transient jaundice. Operation revealed a distended, thickened gall sac and several small pigment stones. Immediate cholangiography revealed a markedly dilated common duct but no stones. About twelve

days after operation, the patient began to have severe right upper quadrant pain and her stools became acholic. Films taken after the injection of hippuran through a T-tube showed a long narrow spastic ampulla. No dye could be seen in the duodenum. The patient experienced typical colic during injection. After the inhalation of an amyl nitrite perle, an ampulla of normal length and width was seen. The spastic sphincters—cause of the ampullary narrowing and of the choledochal dilatation—were relaxed and dye could be seen in the duodenum. The patient made the uneventful recovery of which the surgeons speak.

The question comes up, does the motor dysfunction of the choledochal sphincters precede the presence of stones or infection, or do the muscles become hypersensitive in the presence of a foreign body or inflammation? Post-operative cholangiograms clearly demonstrate that it is possible for the common duct sphincters to function normally in the presence of stones, strictures, and generalized biliary tract infection. However, it seems not illogical to assume that a primary "sphincterismus" in giving rise to bile stagnation, favors the formation of infection and stones. This might have been so in the above case. This concept has been accepted by such an authority as Ivy, and only on this basis can we explain stoneless gall stone colic, post-cholecystectomy return of symptoms, cholangitis without stone or stricture, and the reformation of common duct stones.

What gives rise to this motor dysfunction of sphincter spasm which causes intermittent liver function failure? We do not know. Because of the frequent associated disorders of the heart (slow pulse, extra-systoles), the stomach (hyper-peristalsis, pylorospasm) and the colon, "spastic" constipation) the neurological concept of vagus sensitivity has been invoked. Lichtwitz,²⁸ in a devastating paper on the subject, criticizes out of existence corsets, sedentary life, diminished abdominal movements, (as in pregnancy) constipation, ptosis and so on.

Case 2. J. N., a man about 68 years of age, was operated on for what was thought to be an upper abdominal catastrophe. At operation it was found that the gall bladder was filled to capacity with stones. There were stones also blocking the cystic duct and the lower common duct. One stone was found impacted at the mouth of a distended left hepatic duct. Because of the patient's condition a rapid cholecystectomy was performed, probing and

irrigation of the ducts being curtailed, and a T-tube was placed in the common duct. As was expected, pain, profuse bile leakage, and acholic stools supervened soon after. A cholangiogram at this time showed one stone at the lower end of the common duct and another blocking its duodenal exit. With constant gentle pressure by way of the T-tube and with the simultaneous administration of two ampules of amyl nitrite to extreme flushing, resistance suddenly gave way. A subsequent film showed the opaque medium in the duodenum and jejunum and an absence of filling defects. The patient was treated as just outlined and, we are happy to state, went on to an eventful recovery.

The lines of therapy above described for post-cholecystectomy cases can be carried over successfully to the management of those patients whom the surgeons, from past experience, are loathe to subject to surgery. We have termed these cases "functional" and we conceive them as being different only in degree; they have not yet spilled over into the pathologic. The therapy also serves, therefore, as a prophylactic measure. How can these cases be recognized?

After a complete survey of the patient (with especial reference to the right ureter and kidney) we find that cholecystography is a real stumbling block. The report may be "faint shadow," or there may be "normal concentration of dye but poor emptying." The gall bladder may entirely fail to visualize, yet present normal findings at a subsequent examination. This, we believe, may be the answer and may serve to help to clarify the situation:

It must not be forgotten that the liver is an important physiologic link in the Graham-Cole test. With increased resistance at the choledochoduodenal junction, as by spasm, the secretory function of the liver is deranged. This can be surmised with a proper performance and evaluation of the Bromsulphalein test. The fault can lie in back of the gall-bladder, so to speak. Lahey and Jordan²⁹ in 1931 reported that of a series of 65 intravenous gall bladder examinations which showed no filling, 44% showed good filling after 5-10 days' therapy of the colon. This, we assume, means most likely smooth diet, anti-spasmodics, sedatives, etc. Which is a good way of promoting relaxation of spasm of the choledochal muscles, releasing the increased intraductal pressure, and restoring normal liver function. Lahey and Jordan offer no explanation, but our concept is susceptible of clinico-experimental proof, as we hope to show in a subsequent paper.

X-ray examination of the gall bladder is immeasurably aided by biliary drainage and the two methods jointly achieve a high degree of diagnostic accuracy. Negative or equivocal X-ray findings and negative biliary drainage findings, in the face of hepato-biliary symptoms, bespeak the syndrome "biliary dyskinesia."

The following lines of therapy will prove successful.

1. Diet.

As Newman says, there should be restraint in the use of coarse irritating foods and "over-interesting cookery." No other dietary restrictions. Fat intake regulated according to the patient's needs. Fruit juices not interdicted.

2. Medication.

Antispasmodics and sedatives.

A favorite prescription with us is:

Tr. Belladonna 20.0

Tr. Hyosc. 15.0

Elix. Phenobarb. ad. 90.0

Sig. one teaspoon $\frac{1}{2}$ hour ac. t.i.d.

Kantor²⁰ has shown that these cases show a "dissociated acidity" (low-normal free acid, high total acidity). On this basis, and because it controls many of the other gastric symptoms, we prescribe Amphojel or Creamalin in milk between meals.

3. Duodenal Drainage.

This serves to relax the sphincters and decompress the biliary system. By some it has been abused to the point of quackery. The procedure is lengthy, arduous, and not without unpleasantness to the patient. The effect is not prolonged. We have shown that more adequate and prolonged biliary drainage can be obtained with decholin and trinitroglycerine. Decholin markedly increases the secretory pressure of the liver. With the patient lying down we inject 10 cc. 20% solution intravenously and administer 2 1/100 grain tablets of trinitroglycerine under the tongue 10 minutes apart. This is done three times during the first week, followed by a maintenance dose of 2 Decholin tablets t.i.d. after meals. Incidentally, this will take care of the constipation which is an inevitable complaint. The nitroglycerine should be taken lying down t.i.d. every other day. The latter and the decholin can be tapered off with symptomatic improvement. For extreme pain, amyl nitrite affords relief.

The following case report is illustrative.

Case 3. L. M., a 21 year old intelligent colored housewife, first sought relief from persistent vomiting and severe abdominal pain in the night-emergency clinic of the Johns Hopkins Hospital. Except for marked tenderness in the right upper quadrant, the general physical examination was negative. We saw the patient in the clinic the following morning.

The hypo. of 64 mg. Codeine and 96 mg. of Luminal had made her no better and she retched all night. History revealed that following delivery of her second child six months previously she began to experience upper abdominal pain, nausea, and vomiting, recurring every three weeks with increasing severity and lasting for longer periods of time. The rest of the history was irrelevant.

The physical examination showed a well developed and well nourished young colored woman with the typical haunted look of one on the continual verge of vomiting. There was definite tenderness and spasm of the right rectus and on pushing the liver from behind, one had a feeling that the gall bladder could be delineated. Noticeable was scleral and sublingual jaundice.

The blood studies revealed an icteric index of 14% and a positive direct Vanden Bergh. The Wasserman reaction was negative. There was no leucocytosis or anemia. The urine was bile and urobilin positive. X-rays of the chest and abdomen were negative. Report of a Graham-Cole test read: "Gall bladder concentrates dye in a subnormal manner. No definite evidence of stones." A duodenal drainage was performed with considerable difficulty, but normal A, B, and C, bile was obtained. No pathologic crystals.

After a regime of a smooth diet, tr. of belladonna to tolerance, and mineral oil, the patient returned in two weeks with a report that she had had six attacks of abdominal pain, nausea, and vomiting lasting 2 to 4 hours. We now gave the patient decholin intravenously and by mouth, and nitroglycerine. The relief from symptoms was dramatic and progressive. The jaundice disappeared. The gall bladder was re-X-rayed several months apart. The reports read: "Gall bladder functions normally. No stones are demonstrated."

The patient became pregnant again but remained symptom-free, the only medication being tr. of belladonna and nitroglycerine for occasional pain.

Other studies on this patient of the relation of the hepato-biliary system to pregnancy cannot be gone into here.

Surgery and Liver Involvement

It is not within the scope of this paper to discuss the complicated topic of jaundice. We do want to mention briefly some important new work which especially concerns the surgeon.

One of the most important post-operative complications occurring in jaundiced patients is bleeding. It is well known that the jaundiced patient will

usually show no tendency to hemorrhage either clinically or by laboratory test, yet he may have serious bleeding soon after operation. Calcium and fibrinogen have been repeatedly investigated in jaundice and found to be of no etiologic significance.^{31 32} Quick³³ has offered evidence showing the important relationship of the prothrombin factor in the mechanism of blood coagulation and the bleeding tendency in jaundice. By a careful quantitative method he has found that a wide margin of safety normally exists, so that the usual methods of coagulation time determinations may remain normal until more than 80% of the prothrombin is lost. A decreased prothrombin may therefore exist which is not sufficient to exhaust the margin of safety, but which will bring the patient into the hemorrhagic zone when the trauma of operation and anesthesia (further injury to the liver)³⁴ are added.

It has been found that the prothrombin factor is reduced not only by liver damage but also by an avitaminosis.³⁵ It seems that a fat soluble vitamin (vitamin K) is required for normal blood coagulation. Quick³⁶ and others have very rationally suggested that the bleeding in patients with a biliary fistula or with common duct obstruction, is due to the absence of bile acids in the intestinal tract. This causes a faulty absorption of vitamin K, the bile being a carrying agent for the vitamin across the intestinal mucosa. Snell³⁷ has recently reported that vitamin K is an extremely important factor in the bleeding of jaundice and should receive prime consideration in handling post-operative hemorrhage.

The following management of the jaundiced patient, or of any patient undergoing biliary tract surgery, is based on sound scientific ground.

Pre-operative.

1. Dextrose generously by any or all routes is now a *sine qua non*.
2. Gelatin, because of its content of aminoacetic acid, has been advocated by Quick and has a rational basis.
3. The vitamins (viosterol, etc.) and calcium intravenously are included on empiric ground.
4. The Boyce (quoted) Serum Volume Test for the hemorrhagic diathesis in jaundice is a handy guide in the estimation of the bleeding tendency.
5. Avertin and amylene hydrate should be avoided as anesthetics. Local anesthesia plus nitrous oxide and oxygen are best.

Post-operative.

1. All the measures outlined previously.
2. Decholin by mouth and a dietary to include a liberal supply of fat will assist in the absorp-

tion not only of vitamin K, but of vitamins A and D as well.

3. Dextrose and gelatin as before.

For bleeding, or when the Serum Volume Test (Boyce) shows a bleeding tendency:

1. Repeated small transfusions. (Prothrombin concentration rises quickly but only temporarily.)
2. Vitamin K in the form of powdered alfalfa leaf or the prepared extract.

The dramatic effect of the latter is illustrated by the following case which we present through the courtesy of Dr. Walter D. Wise of Mercy Hospital of Baltimore.

Case 4. C. H., a 56 year old white man, was first seen by Dr. Wise on April 8, 1938, with a history of progressive, painless jaundice. There had been loss of 25 pounds during the past month. No nausea, belching, hematemesis, or history of gall bladder symptoms. The stools were acholic, the icteric index extremely high, and the Vanden Bergh biphasic. The serum bilirubin ranged around 12 mg. per cent. The other laboratory studies were negative. After extensive and appropriate pre-operative preparation, the patient was operated on and was found to have, surprisingly, stones in the gall bladder and cystic duct. These, as well as the common duct, contained "white bile." A T-tube was left in place.

The patient did fairly well, draining good yellow bile soon after the operation. Later, however, the stools became acholic. The prothrombin clotting time was 70 seconds (definitely abnormal) and the patient showed persistent bleeding in spite of all measures. He was now given vitamin K which was received from Dr. Snell of the Mayo Clinic. (Two capsules four times daily and bile salts.) The following day the prothrombin clotting time dropped to the normal figure of 30 seconds and the patient now stopped bleeding. He has shown no bleeding during the past two weeks even though his stools are still bile-free. A regime to attempt to correct the latter has now been instituted.

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THE ART OF GENERAL ANESTHESIA

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Perfection in the art of general anesthesia concerns the safety and comfort of the patient during operative procedures and making conditions more favorable for surgery. As there is a wide variety of anesthetic agents and methods, one must remember the following factors in choosing an anesthetic: 1. The age, habits, physical build, and physical findings of the patient; 2. The type of operation; 3. The surgeon; 4. The ability of the anesthetist.

The choice of premedication also should take into consideration the above factors. It should keep the patient from the scare of the operating room, reduce his psychic shock, and help to give better induction to the anesthetic.

The premedication may start the night before operation when a sedative is given the patient to aid his sleeping during the night. This premedication, consisting of nembutal, or pentobarbital sodium, gr. Iss to III, may be given also to the patient two hours before the operation if he is excitable. In addition, morphine sulphate is usually given hypodermically in doses of gr. 1/6 to 1/4. As morphine gives excitement for one-half hour and then depression for one-half hour, the best time for its administration is a half-hour before the anesthesia. Certain patients may not require morphine if sufficient sedation has been produced by the barbiturates. Atropine sulphate, gr. 1/150, for general anesthesia, or scopolamine hydrobromide, gr. 1/150, for spinal anesthesia, is best given at the same time as morphine.

The patient's blood pressure should be taken, his chest examined, and a routine urinalysis done within twenty-four hours before operation.

In the operating room the anesthetist prepares the patient by taking his blood pressure, pulse, and respiration, and records them on the anesthetic chart. The chest is checked by stethoscope. The history, physical and laboratory findings are checked, and any contraindications to the anesthetic selected are reported to the surgeon. The patient is sized up and is reassured by a few kind words and the gentle manner of the anesthetist. The patient's mouth is examined for artificial teeth or gum. The anesthetic

Read before the Washington County Medical Society, Westerly, Rhode Island, October 12, 1938.

record is kept throughout the operation, and the blood pressure, pulse, and respiration are taken and recorded every ten minutes or more frequently as indicated. Untoward manifestations and drugs used as to time and amount are noted on the chart. The anesthetist will attend to the anesthesia of the patient for which he is responsible and he will not leave the patient's head nor lose track of the respiration for one minute until he is definitely relieved of the responsibility.

Chloroform should be given as an anesthetic only by open drop as the more oxygen inhaled with it the less are the postoperative complications. Its advantages are: 1. Pleasant to patient; 2. Low cost; 3. Easy administration; 4. Excellent relaxation; 5. Prompt recovery. Its disadvantages are that it is the most toxic anesthetic used on the heart during operation and postoperatively on the liver; it may cause cardiac death during operation and liver abscess after operation.

Ethyl chloride is best used either for rapid short anesthesia or only for analgesia. Surgery is started when the patient stops talking or his hand falls and allows one to two minutes of surgery. Its advantages are: 1. Pleasant to take; 2. Low cost; 3. Easy induction; 4. Rapid reduction. Its disadvantages are that it is a cumulative drug which piles up in the body and that respiratory death may occur.

Ethyl ether is the safest anesthetic and is the universal agent of choice. It is usually best given in a semi-closed method with a towel wrapped around the mask. Children, the feeble, the old, and very anemic patients require less inhalation anesthesia and more air and oxygen than normal adults, so for them the towel is rarely used. The anesthetist should apply an eye-pad and grease with vaseline the cheeks and lips of every patient to prevent ether burn. The anesthetic may be started by holding the mask four fingers above the patient's face and dropping ether very slowly until the patient is accustomed to ether vapor. After several breaths, the ether is spread all over the mask at an even rate of sixty drops per minute without changing the position of the mask. After six to eight breaths the mask is lowered very slowly one finger at a time until it rests on the face. Gradually the air is shut off by placing a towel about the mask, first across the chin, then when the patient is used to this, folding it over the sides one at a time. During this time the ether dropping has been kept continuous and constant. Now the rate is increased until the patient is in

surgical anesthesia. The entire period of induction from the beginning with ether to the operative incision should not exceed fifteen minutes. If the patient chokes or coughs, the mask is removed until the patient takes one or two breaths of air, as this condition is due to too concentrated ether vapor and lack of oxygen. If the patient retches or swallows, the amount of ether is increased to deepen the anesthesia. If the patient vomits, his head is turned to one side so that there is free exit for vomitus and the ether dropping rate is increased. If there is shallow breathing or respiratory embarrassment, an airway is gently inserted. Ether convulsions during anesthesia may be due to excess carbon dioxide, ether impurities, cerebral anemia, improper anesthesia or trauma. Its pathology is edema of the brain which causes the characteristic symptoms of clonic convulsions. In treatment, carbon dioxide is not given but barbiturates intravenously or avertin rectally are given, also the head is raised and cold applied to it and the anesthetic is discontinued. During the operation the rate of ether dropping and depth of anesthesia are maintained according to the need of the patient and the stage of the operation. If shock is anticipated because the blood pressure drops 15% or more and the pulse rises, an intravenous solution of 5% glucose in normal saline is started, $\frac{3}{4}$ gr. Ephedrine is given, and ether is stopped until the patient has recovered. A constant check is kept of the respiration during anesthesia and the pulse is kept track of by finger on the temporal or maxillary artery. During surgical anesthesia, the respirations are regular and machine-like, the pupils are contracted or slightly dilated, the eyeballs fixed, the color normal, and the muscles relaxed. In the early surgical stage, inspiration is long and expiration is short; in mid-surgical they are about equal, and in deep anesthesia inspiration is short and expiration is long with sometimes a respiratory grunt. Usually ether can be stopped when the peritoneum has been sutured. 10% carbon dioxide is started about ten minutes before the close of the operation to aerate the lungs and have the patient nearly awake on leaving surgery. The advantages of ether anesthesia are: 1. Inexpensive; 2. Easy administration; 3. Good relaxation; 4. Most fool-proof administration. Its disadvantages are: 1. Unpleasant to patient; 2. Slow in action; 3. Irritant to respiratory tract, kidneys, liver, and brain; 4. Slow, disagreeable recovery with nausea and vomiting. Ether is contraindicated in: 1. Patients

with or recently recovered from acute upper respiratory infections; 2. Patients with severe cardiac embarrassment; 3. Patients with pulmonary pathology seriously interfering with lung ventilation; 4. Caution operations about the head, neck, and chest; 5. Old and debilitated individuals.

Nitrous oxide is the most dangerous anesthetic in inexperienced hands, as the margin between anesthesia and asphyxia is quite narrow. It is taken up in the lungs by the red blood cells and plasma, carried to the nervous centers, and then released in the lungs again, so rebreathing technique by this gas is possible. Nitrous oxide does not give surgical relaxation. Ordinarily one uses 80-95% nitrous oxide. If the oxygen could be kept at 20% there would be no bad effects, but to get some relaxation it is necessary to decrease the oxygen from 20% and increase the nitrous oxide which results in anoxemia which may cause collapsed lung or toxic effects. Good premedication or the addition of ether helps toward better relaxation but also increases the possibility of anoxemia. The advantages of nitrous oxide are: 1. It is non-toxic and non-inflammable; 2. It produces a loose connection with blood and nerve centers causing a pleasant anesthesia and quick, pleasant recovery. Its disadvantages are: 1. It is costly, about \$1.00 an hour, and requires special apparatus and a trained anesthetist; 2. As pink is the optimum color with use of this anesthetic, it is difficult to see this or cyanosis in a colored or anemic person; 3. Anoxemia of nitrous oxide raises the blood pressure so it may prove disastrous in a patient with arteriosclerosis or hypertension; 4. Complete relaxation is not safely obtained. Nitrous oxide is contraindicated in: 1. Myocarditis; 2. Severe hypertension; 3. Shock; 4. Alcoholics and drug addicts; 5. Very young children and babies.

Ethylene is similar to nitrous oxide but is more powerful and gives better relaxation. However, 5-10% of ethylene in air is explosive as well as 25% in oxygen, and higher percentages are inflammable; therefore, the entire anesthetic unit should be grounded to help eliminate static electricity. Ordinarily, ethylene is started with 80% ethylene and 20% oxygen and as anesthesia is deepened it is shifted to 90% ethylene and 10% oxygen. The advantages of ethylene are: 1. It can be used well in existing pulmonary, cardiac, vascular, and renal pathology with functional impairment, and in diabetic surgery; 2. Age is no barrier to its use; 3. Ease of induction and rapidity of recovery;

4. Relaxation without cyanosis; 5. Absence of sweating or respiratory irritation. Its disadvantages are: 1. Oozing at time of operation is more marked than with other anesthetics; 2. Inflammability and explosibility of gas.

Cyclopropane is a powerful gas, effective with a large amount of oxygen, and it is superior to either ethylene or nitrous oxide; however, if its concentration exceeds a volume of 3% in air or reaches 50% by volume in oxygen, the mixture is explosive. It must be used with caution as it is effective in 15-20% concentration with 80-85% oxygen. The patient stops breathing if the oxygen falls below 80%. The patient's pulse and respiration should be carefully watched especially during induction, and any sudden irregularity in character should be a warning to change from cyclopropane to some other anesthetic agent. If necessary the addition of ether helps toward better relaxation. Cyclopropane is particularly valuable in chest surgery as it assures adequate oxygenation. In obstetric operative procedures, it gives adequate oxygenation for both mother and baby. Its advantages are: 1. Wide margin of anesthesia without anoxemia; 2. Excellent relaxation; 3. Low toxicity with little or no action on kidneys, liver, or acid balance; 4. Very low incidence of pulmonary complications; 5. Pleasant to patient, quick induction, and quick recovery; 6. Valuable for patients suffering recent upper respiratory tract infections or for patients suffering severe cardiac debility. Its disadvantages are: 1. Costly, so that the carbon-dioxide absorption method of anesthesia is most practical for its use; 2. Inflammable and moderately explosive; 3. Depressive vascular action and toxic action on heart muscle in some cases; 4. Slight respiratory depressant.

Divinyl ether or "Vinethene," in a concentration of 25% vinyl ether with 75% ethyl ether, administered by the open method, makes for a safe, rapid, analgesia-anesthesia. Vinyl ether may also be used alone with oxygen by the closed method, but it is apparently no more advantageous and has more waste from rapid volatilization than when used with ethyl ether. Its advantages are: 1. Very slight toxicity; 2. Smooth muscles as of uterus and intestines are not depressed; 3. Easy administration and maintenance of narcosis degree; 4. Induction and recovery time cut down 30-50% over straight ether anesthesia; 5. Wide anesthetic-lethal margin; 6. No effect on coagulation time of blood;

7. Good abdominal relaxation. Its disadvantages are: 1. It is inflammable and forms, as does ethyl ether, highly explosive mixtures with certain proportions of air, nitrous oxide, or oxygen; 2. Occasional liver damage and respiratory embarrassment.

Avertin (tri-brom-ethyl-alcohol) is a one-dose anesthetic and is uncontrollable as it is injected in the rectum. It is recommended solely as a basal anesthetic. It is used in the dosage of 80-100 mg. per kilo, but usually as 80 mg. per kilo. In deciding the dosage, one considers these factors: 1. Body weight; 2. Body—muscular, bony person takes higher dosage than fat, small-boned person of same weight; 3. Age—the younger the person the higher the dose, except in babies because they do not co-operate; 4. Bone cases need higher anesthesia than abdominal cases; 5. Pathology—tumor cases need higher dosage. In the administration of avertin, the patient should be accurately weighed and the bowel cleaned out by enemata the night before operation. The dosage is determined and the mixture is made up fresh at the time of using. The mixture may be taken from the dosage tables or determined in the following manner: body weight divided by 2.2×4 equals amount of distilled water which is added to the avertin-amylene hydrate, and this solution is heated to 40 degrees C. in a closed receptacle. It is tested for chemical changes with Congo red. If the solution is satisfactory, it is introduced slowly over a period of five minutes through a firm rectal tube with the patient lying on his left side. Then the tube is clamped off and left in the rectum and the patient is turned on his back. If the patient becomes too depressed at any time, the tube can be used for withdrawing the mixture. One waits twenty minutes before giving supplementary anesthesia. If the patient becomes too depressed, the colon should be washed out and one pint of black coffee injected. Coramine (1-2-3 capsules) is a sure antidote for avertin in shock cases. The advantages of avertin are: 1. Non-irritating; 2. Valuable for neurotic patient; 3. Best anmesia of any reagent; 4. Useful in all branches of surgery. Its disadvantages are: 1. It is contraindicated in liver damage, acute renal disease, severe cardiac involvement, intestinal lesions, marked hypothyroidism, severe pulmonary tuberculosis, empyema, shock, acidosis, sepsis, toxemia, and cachexia; 2. Caution is necessary with elderly, dehydrated, obese or debilitated patients, and these should not receive over 70 mg. avertin per kilo; 3. It is a respiratory depressant.

Ether-oil, barbiturates as evipal soluble, and paraldehyde are also given rectally and are somewhat similar in action to avertin, as they are best used for basal anesthesia. Two ounces of ether-oil are absorbed per hour rectally, so six ounces last three hours. With ether-oil, patients pass through the secondary stage the same as by inhalation, so it gives an excitement phase. For preanesthetic rectal administration of evipal soluble, one gives 0.2 cc. of a 10% aqueous solution for every pound of body weight. It is valuable for quick-acting and quick-receding basal anesthesia.

Spinal anesthesia is suitable for a wide variety of operations below the diaphragm. Procaine, metycaine, or pontocaine are the usual agents of choice. Procaine is the safest agent, pontocaine gives possibly the longest duration of anesthesia, and metycaine may be considered as between these two as far as toxicity and duration of anesthesia is concerned. For the anesthetic procedure a sterile spinal tray should be ready. The patient's blood pressure is taken and he is turned on his side, knees drawn up to chest, head touching knees, shoulders and hips vertical. The anesthetist scrubs his hands for five minutes, dips them in alcohol, and dons sterile gloves. He prepares the patient's back with ether, iodine, and alcohol, and then sterile drapes. Ephedrine gr. I is given subcutaneously into the buttocks. A 10 cc. Luer syringe is filled with the proper dose of the agent, the correct lumbar interspace is infiltrated with 1% novocaine solution, and a spinal needle is inserted into the spinal canal. When the clear spinal fluid appears, the 10 cc. syringe is attached and the proper amount of spinal fluid withdrawn slowly. Then, if necessary, the syringe is detached from the spinal needle, the stylet replaced, and the spinal fluid and agent mixed by shaking the syringe. The Luer syringe is connected again to the spinal needle, a small amount of fluid withdrawn to see if the needle is still in place, and the solution is then injected slowly. Then the needle is withdrawn quickly from the back with syringe attached, the puncture sealed with collodion, the patient turned flat on his back, and the head of the table lowered 10°. Fifteen minutes after the completion of the spinal anesthetic is the optimum time for surgery. During the operation, if the patient is nauseated, vomits, has low blood pressure, very slow or very fast pulse, oxygen or carbon dioxide is given. Chips of ice will soothe his dry mouth. Intravenous glucose is given for hemorrhage or

surgical shock. An icecap to the head alleviates headache. For restlessness, a small dose of morphine or gas analgesia is given. When the spinal wears off, ether is given if the abdomen is open, otherwise gas is given. The average dosage for spinal anesthesia is as follows:

PROCAINE: (crystals)

Operation	Dosage	Spinal Fluid	Interspace
Rectum, perineum, legs.....	100 mg.	1-2 cc.	4th lumbar
Abdomen	150 mg.	3-4 cc.	4th lumbar

(Procedure—as given previously).

METYCAINE:

(2 cc. 10% soln. ampoules, 1 cc. has 100 mg.)

Operation	Dosage	Diluted with Spinal Fluid	Interspace
Perineum4-.8 cc.	1.5-3.0 cc.	3rd & 4th lumbar
Lower abdomen8-1.4 cc.	4-5 cc.	2nd & 3rd lumbar
Upper abdomen	1.5-2.0 cc.	5 cc.	1st & 2nd lumbar

Never give more than 1 mg. of metycaine per pound of body weight. Immediately after injection, the patient is placed on his back. For abdominal anesthesia, the table is tilted to 10 degrees Trendelenburg, but the patient's head is flexed forward on his chest by a pillow which makes the midthoracic region the lowest part of the spine, and the metycaine gravitates to that part. As soon as the anesthesia reaches the desired height, which takes about three to eight minutes, the table is leveled to check the effect of gravity. After twenty minutes, gravity has no further effect on the drug and the Trendelenburg position may be used if desirable.

PONTOCAINE:

(2 cc. 1% soln. ampoules, 1 cc. has 10 mg.)

One mg. of the hydrochloric for each 10 pounds of body weight plus five mg. is the dosage for the average adult. The 2nd or 3rd lumbar interspace is usually preferred. An equal quantity of spinal fluid is withdrawn, so that the injected solution is of a 0.5% solution. This is injected at the rate of one-half cc. per second. The patient is then placed in the level prone position for five to eight minutes to produce sensory block. Then he is turned over in the dorsal position, and the table is turned to a five degree Trendelenburg.

The advantages of spinal anesthesia are: 1. It is best agent for relaxation; 2. Low cost; 3. Easy use; 4. Pleasant postoperative course for patient; 5. Fewer postoperative complications; 6. Allows simultaneous use of electrical apparatus. Its contraindications are: 1. Patients in shock; 2. Psychic, nervous, or apprehensive patients; 3. Operations of longer than 1½ hours; 4. Children of 12 years

or less who are not cooperative; 5. Respiratory or heart cases, as spinal anesthesia is a respiratory and cardiac depressant; 6. Systolic blood pressure 80 mm. or less, pulse pressure of about 20, and debilitated patients; 7. Severe hypertension with systolic blood pressure of 200 mm. or over; 8. Diseases of the central nervous system or spine; 9. Septicemias; 10. Gun shot wounds of the abdomen.

Sodium pentothal, sodium evipal, and other intravenous anesthetics are used chiefly for a short deep anesthesia, but may be used for a prolonged lighter anesthesia. Sodium pentothal is more potent than sodium evipal. Sodium pentothal is used as a 5% solution by dissolving one gram of the crystals in 20 cc. of distilled water. Sodium evipal is used in a 10% solution. While the patient counts aloud, thirty seconds are allowed for intravenously injecting 2-4 cc. which usually induces unconsciousness. Then 1-2 cc. more are injected to produce the required degree of anesthesia and relaxation. The duration of anesthesia should last 15-20 minutes. If necessary, or for longer anesthesia, a supplemental dose of the respective solution may be given slowly and intermittently, with the needle continually in the vein, but the total dose given should not exceed 10 cc. for adults. During the injection the position of the jaw should be kept forward, an airway inserted, and a wisp of cotton placed over the nostrils or mouth which by its motion will denote inspiration and expiration. For respiratory depression, coramine, oxygen, or carbogen are given. The advantages of intravenous anesthesia as sodium pentothal are: 1. Ease of giving. Its disadvantages are: 1. Uncontrollable; 2. Vigorous cardiac and respiratory depressant; 3. Post-operative excitement; 4. Special precautions and reduced dosage in liver diseases, old or debilitated individuals, and septic, toxic patients; 5. It may cause spasm of larynx requiring tracheotomy.

Intratracheal anesthesia provides a free unobstructed airway with resulting quiet, effortless breathing. The Magill method is the best procedure. This consists of pushing a sterile, greased, soft rubber, intratracheal tube into one nostril, through the larynx and down into the trachea, after anesthesia has been well induced. Then the anesthetic agent may be given to the patient as desired, oxygen when needed can be given to reach the alveoli immediately and resuscitation can be performed when necessary. It is a valuable method for head and neck operations because the anesthetist is out of the way

of the surgeon and a clear airway is assured. It is invaluable for chest operations because by it pulmonary pressures can be controlled. In abdominal operations, the quiet respirations and lack of laryngeal spasm make this method of utmost value.

Pharyngeal anesthesia through the nose or mouth is useful in operations about the head or neck where a mask cannot be used on the face, where the mouth must be open, or where the anesthetist must be out of the field of operation. It may be given by insufflation with ether, or by to and fro respiration with one of the gases or with ether.

The carbon-dioxide absorption method provides for a tremendous saving in the amount of anesthetic used. With this method a soda lime container is used which removes the carbon dioxide so that the same gases can be used over and over again without disturbing the character of anesthesia provided a constant flow of oxygen sufficient to support metabolism is maintained. The character of the patient's breathing may be controlled by altering the amount of carbon dioxide which he receives and this results in quiet breathing. The gases soon reach body temperature and become moisture laden so that the patient's body heat is preserved and the danger of explosion from static electricity is minimized. This method is especially valuable in neck, chest, and abdominal operations. It has allowed the use of gas anesthesia for many patients who formerly could not economically afford it.

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THE NATIONAL HEALTH PROGRAM

Last July the so-called National Health Program was presented to the National Health Conference and the public. This program was contained in the report of the Technical Committee to the Inter-departmental Committee. The Technical Committee consisted of Dr. Martha Elliot of the Children's Bureau, Dr. Falk of the Social Security Board and Drs. Mountin, Perrott and Waller of the United States Public Health Service.

This report makes the following recommendations: A gradually increasing maternal and child health service is advised. This includes medical and nursing care for mothers throughout maternity, including delivery, with facilities for consultations and expert diagnosis; this work to be carried on by local physicians. Health supervision and medical care for children would be provided, this care also to be given by local physicians with consultations and hospitalization when necessary. This service to families with an income of \$1,000.00 or less would ultimately cost \$95,000,000 a year, with the Federal Government supplying one-half.

The program for public health services is especially planned to attack tuberculosis, venereal dis-

ease, pneumonia, cancer and malaria, and to support work in mental and industrial hygiene. This would eventually cost \$200,000,000, of which the Federal Government would contribute one-half.

The program for increase of hospital facilities is based on many statements like the following: General hospital service is not available to a large segment of the population because of the faulty location or inability to purchase care. Construction of hospitals is recommended as follows:

General Hospitals	\$630,000,000
Tuberculosis Hospitals.....	150,000,000
Mental Hospitals	325,000,000

\$1,105,000,000

One-half of this would be provided by the Federal Government.

Appropriations for care of the medically needy are recommended. This would be developed around existing preventive health services. It would provide minimum essential needs, including medical and surgical care, hospitalization and emergency dental care. It would extend to 40,000,000 persons in families of the \$800 income group. This would cost \$400,000,000, of which the Federal Government would contribute one-half.

A general program of medical care is recommended. The two types of service possible are a system of public, tax supported, medical services, and compulsory health insurance. The choice between these two would be made by each state and the program arranged by the state. The eventual federal support would amount to between one-fifth and one-third of the \$2,600,000,000 cost.

Insurance in cash against loss of wages by sickness is advocated. The system of compensation for temporary disability is best patterned after unemployment insurance. For permanent disability the system should be patterned after old age pensions. The first would cost approximately 1 per cent of the wages, the second in twenty years would cost between 1 per cent and 2 per cent of wages.

It is impossible to discuss this program in detail in an editorial. Many of us will feel that it is unadvisable at the present time for the State and Federal Government to make large new appropriations. As medical men, however, it is our obligation to distinguish between proposals which offer definite health advantages to the people and those which do not. The report of the Reference Committee of the House of Delegates of the A. M. A. has set an admirable example in this respect.

This report recognizes that the maternal and child health and the public health services can be enlarged with advantage to the public, although the treatment of disease should be included only when it cannot be successfully given by the private physician.

The construction of new hospitals is approved where such a need exists, although it is believed that the Technical Committee has exaggerated the need. More research facilities for mental disease are obviously needed.

More care of the medically needy is evidently desirable. This should be supplied by the local community. State and federal aid should only be given if the community is unable to furnish this service.

In regard to the general program of medical care, hospital service insurance is obviously valuable. Voluntary cash indemnity insurance plans should be more widely used. The county or district medical society should try to meet the need as it exists in that locality. It seems evident to an overwhelming majority of physicians that any system of public medical care or compulsory health insurance would introduce a bureaucratic organization which would be expensive, inefficient, subject to political control and manipulation, and would surely fail to give the people high grade service.

Insurance against loss of wages during sickness seems in principle to be sound. It is, however, in the interest of good medical care that the attending physician be relieved of the duty of certification of illness.

The report of the Committee of the Rhode Island Medical Society follows the lines of the report of the Reference Committee of the American Medical Association. Several paragraphs in this report are especially interesting.

Under the heading of Expansion of Hospital Facilities, the Rhode Island report says "The hospital situation in Rhode Island would seem to indicate that there is need for providing some arrangement by which the indigent of the smaller towns can use the existing hospitals in the State. If this is done we are of the opinion that existing facilities will be sufficient."

Under the heading of Medical Care for the Medically Needy the Rhode Island report includes the following paragraph. "We believe that in Rhode Island, at any rate, the interests of the public will best be served by a minimum amount of home and office care of the medically indigent, and generous

contributions from tax funds for the medical care at the hospitals. We believe that the medically indigent can best be cared for when hospital facilities are available when needed, as the private practitioner cannot be expected to bear the burden of carrying out expensive technical procedures."

The Rhode Island Committee also emphasizes the statements that medical plans should be made and supported as far as possible by the local governmental units and that these should be made with the co-operation and approval of the Rhode Island Medical Society.

This very brief and superficial discussion of the National Health Program indicates some of the questions involved. We shall do well to keep informed on the proposals for new forms of medical care, as we owe it to the public and to our own self respect to be able to talk intelligently about these most important matters.

RHODE ISLAND MEDICAL SOCIETY

January Meeting

At the request of the House of Delegates, a special meeting of the Rhode Island Medical Society was held at the Medical Library on Friday, January 6, 1939. The meeting was called to order by the President, Dr. Edward S. Brackett, at 8:15 P. M.

The President first called upon Dr. Elihu S. Wing, Chairman of the Committee on Hospitalization Insurance, who read the report of that committee. Dr. Hammond moved that the Rhode Island Medical Society approve the report of the committee and use every effort to secure the passage of an enabling act. The motion was seconded by Dr. Dimmitt and unanimously carried. The President next called upon Dr. Roland Hammond, Chairman of the Social Service Committee of the Rhode Island Medical Society, who read the report of his committee. Dr. Gornly moved that this report be approved and that it be printed and a copy sent to each member of the Society. The motion was seconded by Dr. Hunt and was carried.

The President then introduced Dr. Rock Sleyster, President-Elect of the American Medical Association, who was greeted with enthusiastic applause. After extending the greetings of the parent Association to this State Society, Dr. Sleyster gave an address which was listened to with attention and

was applauded during its delivery as well as at the close of the address. Dr. Sleyster outlined the advancement in medical science and the progress of the American Medical Association in raising American medical schools and hospitals to their present high standard, eliminating quackery, fostering public health work and in the war against infectious disease. As a result we have in this country the lowest mortality and morbidity ever chronicled in history.

Dr. Sleyster indicated that every step in medical progress had been taken against opposition. For some years there has been a gradual building-up toward the introduction of foreign systems of medical care. With the depression came the demand for social security. Now, disregarding their unselfish devotion to the public welfare and the millions of dollars worth of charity work which they annually perform, the doctors are made the scapegoats. In the meantime the American Medical Association is not idle. While the delivery of medical service is only a part of the work, more than three hundred plans for medical service for those unable to pay the usual fees or for the indigent are being tested. The American Medical Association is not a building in Chicago; it is an association of the state medical societies, in turn comprising the component district societies. Under this organization the present success in medical work has been achieved. Shall we give up this plan for any European plan?

Following the applause at the close of the address, the President expressed the Society's appreciation of Dr. Sleyster's inspirational talk. The meeting was adjourned at 10:15 P. M. Collation was served. Attendance, 156.

Report of the Committee on Hospitalization Insurance

The following is a report on the activities of the committee appointed by Dr. Brackett representing the Rhode Island Medical Society pertaining to the Hospitalization Insurance Plan in response to a motion made by Dr. Gerber at a previous meeting of the Rhode Island Medical Society.

The *first* meeting of this committee with all nine members present and including Dr. Brackett, President of the Rhode Island Medical Society, was held on November 3 at which time the following resolution was unanimously adopted:

"RESOLVED: 1. That this committee go on record as favoring a Group Hospitalization Plan in principle,

"2. That these principles as pertaining to services given the insured under the Plan should confine themselves with provisions of hospital facilities only and should not include any type of medical care. An exact determination of what constitutes hospital facilities and medical care should be left to consultation between the committee representing the State Medical Society and the Hospitalization Steering Group."

The *second* meeting of this committee was on November 10 and was a joint meeting between the members of this committee and a sub-committee representing the Steering Committee of the hospital group and was presided over by Dr. Brackett. All members of the medical committee were present except one. At this meeting the action of the committee representing the Medical Society taken November 3 was read and it was requested that any use of this resolution should be qualified by the statement that this was purely a decision of the committee and had not been referred to the Society for approval.

Mr. Lindblad then reviewed the work of his committee as outlined in his report.

The discussion which followed this report is outlined by the secretary of the Hospitalization Plan committee as follows:

"It is apparent that, some considerable sentiment exists in the medical profession against approving of any action until all details of the entire Plan had been worked out and incorporated in the enabling act to be presented to the Legislature. This feeling is largely due to apprehension that otherwise, once the enabling act is passed, the Plan adopted might include services of a medical nature and as such be objectionable to the medical profession.

"Since for a variety of reasons it is impracticable to attempt to write all such details into the enabling act, it was suggested that this question could be eliminated for the time being if the hospitals which contemplated entering into the Plan would go on record as agreeing that they would *not* consent that any plan be put in operation which did not have the approval of the Rhode Island Medical Society.

"The whole subject of the nature of the services to be included has been very troublesome elsewhere. There are very good reasons from the point of view of the public for including as much as possible within the service to be rendered under the Plan, to the end that the first cost will also be the last cost;

but rather than have the formulation of the Plan delayed interminably while such controversial issues are debated, your committee feels that the public's interests are better served by putting a plan into operation at this time, eliminating therefrom such items as X-ray and anaesthesia.

"While it has been impossible in the short space of time which has elapsed since the above meeting to communicate with all members of your Committee, it was the sentiment of the undersigned that its report should be amended to include a further recommendation as follows:

"4. That the hospitals contemplating membership in the Rhode Island Hospital Service Plan go on record as not being willing to consent to *any* plan for non-profit hospital service not approved by the Rhode Island Medical Society in respect to the character of the medical services to be included in the Plan."

This was signed by the seven members of the Hospital Group Committee present.

A report briefly covering the activities of your committee representing the Rhode Island Medical Society on the study of the Hospitalization Insurance Plan has been sent to the secretaries of the various county Medical Societies that they might be kept in touch with the work of the state Society committee.

The chairman of the committee representing the Medical Society has sent out questionnaires to all the members of the Medical Society committee and a few other medical staff members of hospitals asking for interpretations of what they regard as involving medical care as pertaining to anesthesia, X-ray, etc., and how their local hospitals now handle their semi-private cases with respect to these departments. The data from this questionnaire will be used in subsequent meetings with the Steering Committee when the details of the Plan are brought up.

In discussion between the sub-committee representing the hospitals in the Plan and our committee, certain points were cleared up. Dr. Rochelieu of Woonsocket stated that it is our desire to avoid abuses which were creeping in to other Plans now operating as pertaining to medical services and suggested that we be represented on the governing body. This is covered in the Plan by a representation from the Rhode Island Medical Society on the Board of Trustees and also the Executive Committee consisting of five members.

The desire of the Steering Committee group in their early work was to formulate purely the basis

or groundwork for a non-profit Hospitalization Plan and this they wished to accomplish before they brought it to the medical profession in order that they might have a talking understanding of this situation. It was meant, in no way, to ignore the medical profession as up to that time and even now the actual details of the Plan have not been worked out. The effort on the part of that committee to get an enabling act passed at the last legislature was that they might save much time, perhaps a year, in the eventual launching of a Plan as this was part of the ground work in getting a Plan started. The passage of an enabling act is one of the first things to be accomplished but perhaps it is fortunate in one way that it has been somewhat delayed because a better act will result. The tentative final draft for this enabling act is now completed.

Another meeting of this committee with the sub-committee of the Hospital Group is to be held soon.

Respectfully submitted

ISAAC GERBER, Providence
HARTFORD P. GONGAWARE, Westerly
JAMES HAMILTON, Providence
JOHN F. KENNEY, Pawtucket
WALTER C. ROCHELEAU, Woonsocket
ALFRED M. TARTAGLINO, Newport
GUY W. WELLS, Providence
ROBERT H. WHITMARSH, Providence
ELIHU S. WING, *Chairman*, Providence

PROVIDENCE MEDICAL ASSOCIATION

Minutes of the January Meeting

The Annual Meeting of the Providence Medical Association was called to order by the President, Dr. Alex M. Burgess, on Monday, January 9, 1939, at 8:40 P. M. The minutes of the preceding meeting were read and approved. The annual report of the Secretary was read by Dr. Herman A. Lawson and was approved and placed on file as was also the annual report of the Treasurer as presented by Dr. William P. Davis.

The Secretary reported for the Standing Committee and presented the names of the following applicants for membership: Kate E. Breslin, William J. Butler, Joseph N. Corsello, Eugene A. Field. On the motion of Dr. W. M. Muncy these applicants were elected to membership. Reporting further for the Standing Committee, the Secretary announced as follows:

That the Standing Committee had authorized the Executive Secretary to prepare data on the

medical condition of the community, as obtained by the American Medical Association Survey, for the confidential use of the State's legislators in Congress.

That the Standing Committee requests the Publicity Committee to prepare a list of definitions of terms, such as state medicine, socialized medicine, group hospitalization, which are to be approved by the Standing Committee and then distributed to local press agencies as the interpretation of this Association and as a guide to all such agencies in preparing press news, editorials, or headings.

That the By-Laws be revised concerning the payment of dues by applicants for membership.

That a brief expression be prepared by the Standing Committee relative to the position of the Association regarding Group Hospitalization locally.

The annual report of the Standing Committee was read by the Secretary, and was accepted and placed on file.

The President announced that a printed copy of all the reports of committees for the year would be available to all members.

The President reported that the obituary of Dr. Vance Lee Fitzgerald as prepared by Dr. George Shattuck and Dr. Herbert Partridge and that of Dr. Daniel S. Latham as prepared by Dr. Arthur Jones and Dr. Pearl Williams were on file with the Secretary and available to any member.

Following the Presidential Address, the following officers and committees were elected for the year 1939:

President: Harry C. Messinger.

Vice-president: John G. Walsh.

Secretary: Herman A. Lawson.

Treasurer: William P. Davis.

Members of the Standing Committee for five years each: Alex M. Burgess, Frank B. Cutts.

Trustee of the R. I. Medical Library for one year: John E. Donley.

Councillor: William S. Streker

Reading Room Committee: Fred A. Coughlin, Robert G. Murphy, Joseph B. Webber.

Delegates to the House of Delegates of the Rhode Island Medical Society: Americo J. Pedorella, James M. Beardsley, Carl R. Doten, Henry J. Gallagher, Nathan A. Bolotow, Joseph Franklin, Charles Bradley, William S. Streker, Herman A. Lawson, Jesse P. Eddy, 3rd, Daniel V. Troppoli, Maurice Adelman, Francesco Ronchese, Alex M. Burgess, George F. White, Meyer Saklad, John

A. Hayward, Harry C. Messinger, Ernest W. Bishop, Charles L. Southey, Henry McCusker, William P. Buffum, James Hamilton, John G. Walsh, Merle M. Potter.

The President appointed Dr. William S. Streker and Dr. William P. Davis a committee to escort the new President to the Chair. Following his installation into office, Dr. Messinger spoke briefly of the fine work of the Association during the year under the Presidency of Dr. Burgess and asked that the same cooperation from the membership be continued through the coming months.

The new President announced the following changes in Committee personnel for 1939: Dr. Eske H. Windsberg replaces Dr. H. C. Messinger as Chairman of the Committee for the American Medical Association Survey of the Needy and Supply of Medical Care. Dr. Paul Appleton replaces Dr. J. G. Walsh as a member of the Blood Transfusion Bureau. The Collation and Golf Committees are combined as a Committee on Entertainment with Dr. Nathan A. Bolotow as Chairman. Dr. Robert C. Robinson and Dr. A. M. Burgess are appointed to succeed Dr. Halsey DeWolf and Dr. Frank T. Fulton whose terms have expired as members of the Committee on Ethics and Deportment. Dr. Henry E. Utter is re-appointed a member of the Medical Milk Commission.

The President announced that the complete list of all committee appointments for 1939 was included in the printed Annual Report to be distributed to all members.

The Secretary announced receipt of a communication from the State Medical Society requesting that the members of the Providence Medical Association be informed of the Sunday afternoon radio broadcasts being conducted by the Society over station WPRO.

Dr. William P. Buffum read a preliminary report of the Committee on Tuberculosis, which was accepted and placed on file. The President appointed Dr. M. B. Milan and Dr. Thomas Grzebien as a committee to prepare an obituary of Dr. Richard Boucher.

On a motion from the floor by Dr. F. B. Littlefield it was seconded and passed that the Association donate \$450.00 for the use of the Library Building. On a motion from the floor by Dr. William S. Streker it was seconded and passed that the Association appropriate \$3400.00 for the executive office, for salary, rental of office, and incidentals. Dr. Paul Cooke moved that the annual dues of the

Association for the year shall be \$15.00 for each member. The motion was seconded and passed.

Dr. William S. Streker presented the report of the sub-committee of the Standing Committee which was appointed to prepare a revision of the By-Laws relative to the regulations for application for membership in the Association. The changes proposed were as follows:

I. That Section 1 of Article II, titled Membership, be amended to read as follows: Applications for membership shall be made in writing to the Secretary and must be endorsed by two active members, and must be accompanied by a deposit of the amount of the annual dues, which deposit shall be returned if the applicant is rejected. The Secretary shall refer the application to the Standing Committee which shall report favorably upon it to the Association at the next regular meeting or as soon thereafter as may be, or adversely to the applicant.

II. That Section 4 of Article II, titled Membership, be amended to read as follows: Every person elected to membership shall without delay sign the Constitution and By-Laws.

III. That Section 1 of Article III, titled Annual Dues, be amended to read as follows: Taxes shall be levied at the annual meeting for the ensuing year, and shall be due when levied. Dues of new members shall be pro-rated according to the quarter of the year in which they have been elected to membership, and any balance remaining from the deposit shall be credited to the next year's dues. The Secretary and the Treasurer shall be exempted from taxation during their terms of office. On the motion of Dr. Charles Gornly these amendments to the By-Laws were approved and made effective as of this date.

Dr. Joyce, chairman of the Committee on Group Hospitalization, presented a brief expression as recommended by the Standing Committee relative to Group Hospitalization. The recommendation was accepted and placed on file.

The business of the meeting being completed, the President invited Dr. Burgess to the Chair to introduce to the membership Dr. A. Warren Stearns, Dean of Tufts College Medical School, who presented as his topic "The Evolution of the Concept of Functional Nervous Disease."

The meeting was adjourned at 11 P. M. Attendance 185. Collation was served.

Respectfully submitted,

HERMAN A. LAWSON, M.D.,
Secretary.

LOCAL EVENTS

January 10. Dr. Stanley Nowak addressed the meeting of the General Staff of the Homeopathic Hospital of Rhode Island with the subject "Pre-operative and Post-operative Treatment."

January 10. Dr. Halsey DeWolf entertained the Amos Throop Medical Club. Dr. John C. Ham read a paper on "Newer Diagnostic Methods and Recent Modifications in Treatment of Pneumonia." The paper was discussed by Dr. Wing and by members of the club.

January 16. At the meeting of St. Joseph's Hospital Staff Association, Dr. Edward Roberts of the Lederle Laboratories demonstrated a film on "Management of the Pneumonias." The film was shown at the Memorial Hospital on January 18.

January 20. Dr. Frank T. Fulton entertained the Friday Night Medical Club. Dr. Marshall N. Fulton of Harvard Medical School read a paper on "Some Atypical Features of Hyperthyroidism." The paper was illustrated by lantern slides and was discussed by Drs. Gornly, Bird, Wells, Messinger, Buffum and by the members of the club.

January 26. Archibald C. Matteson, Esq., addressed the Regular Quarterly Meeting of the Rhode Island Medico-Legal Society. His subject was "The Purposes of the American Law Institute and Some of its Accomplishments."

RHODE ISLAND HOSPITAL

Dr. Charles L. York, Jr., of Plymouth, New Hampshire, a graduate of the University of New Hampshire and Tufts College Medical School, began a two years' internship at the Rhode Island Hospital on December 15th, 1938. Previously, Dr. York spent six months at the Higgins Hospital in Wolfeboro, N. H.

On January 1st, 1939, Dr. Henry A. Campbell, of Central Falls, went to the Boston City Hospital, taking a Surgical Internship, a term of two years, his internship at the Rhode Island Hospital having ended. Dr. Campbell is a graduate of Harvard Medical School.

Dr. Harry G. Hardt, of Chicago, Ill., whose internship terminated July 1st, visited at the Rhode Island Hospital the first week of January 1939. At present Dr. Hardt is interning at Truesdale Hospital, Fall River, Mass.